WE CLAIM:

1. A communications node for an optical network, said communications node comprising:

a tunable wavelength receiver for receiving optical data from source nodes at a plurality of source wavelengths;

a tunable wavelength transmitter for transmitting optical data to destination nodes at a plurality of destination wavelengths; and

a media access controller which schedules transmission to and receipt from a plurality of nodes at a plurality of time-slots and wavelengths according to at least one reservation map.

2. A communications node as recited in claim 1, wherein said communication node further comprises a reservation map unit which creates the at least one reservation map for reserving time slots and wavelengths for transmitting data to and receiving data from a plurality of nodes, made up of the source nodes and destination nodes, based upon available time slots and wavelengths in the optical network, said reservation map being based upon demand data from the plurality of nodes.

3. A communications node as recited in claim 2, wherein said communication node includes a demand matrix generating unit for generating a demand matrix based upon demand data from the plurality of nodes, and wherein said reservation map is based upon said demand matrix.

4. A communications node as recited in claim 3, wherein said reservation map is created based upon demand matrix data transmitted from another of said plurality of nodes.

5. A communications node as recited in claim 3, wherein said demand matrix unit and said reservation map unit are configured for operation with an optical ring network.

6. A communications node as recited in claim 3, wherein said demand matrix unit and said reservation map unit are configured for operation with optical elements of the optical network connected in a star-coupler topology.

7. A communications node as recited in claim 3, wherein said demand matrix unit and said reservation map unit are configured for operation with a local area network.

8. A communications node as recited in claim 2, wherein said reservation map unit is configured to set the reservation map using reservation map data transmitted from another of the plurality of nodes.

9. A communications node as recited in claim 1, wherein said tunable wavelength receiver is optimized with other tunable wavelength receivers of other communications nodes of the optical network, such that the tunable wavelength receiver and the other tunable wavelength receivers are tuned to a common wavelength to receive multicast or broadcast transmissions.

10. A communications node as recited in claim 1, wherein said media access controller reorders said reservation map when said reservation map is blocked such that the available time slots cannot be allocated without causing a collision.

11. A communications node as recited in claim 1, wherein said communication node further comprises a requestor unit, for negotiating an outgoing bandwidth allocation to the destination nodes and an allocator unit for negotiation of incoming bandwidth allocations from the source nodes.

12. A communications node as recited in claim 11, wherein said requestor unit is configured to send a request to allocate or release bandwidth from the allocator unit in the plurality of nodes, according to bandwidth demand data of the communication node.

13. A communications node as recited in claim 12, wherein said allocator unit is configured to receive a request to allocate or release bandwidth from the requestor unit in the plurality of nodes, and is configured to allocate or release time-slots and wavelengths according to at least one of the request, a request priority and system allocation rules.

14. A communications node as recited in claim 13, wherein said allocator unit is configured to allocates or releases time-slots according to local bandwidth demand.

15. A communications node as recited in claim 13, wherein said allocator unit is configured to send acknowledgement for allocating or releasing time-slots to the

requestor unit.

16. A communications node as recited in claim 1, wherein the tunable wavelength receiver is fixed on one wavelength while the tunable wavelength transmitter is tuned for each time-slots according to the at least one reservation map.

17. A communications node as recited in claim 1, wherein the tunable wavelength transmitter is fixed on one wavelength while the tunable wavelength receiver is tuned for each time-slots according to the at least one reservation map.

18. A media access controller for a network, said media access controller comprising:

a reservation map unit which creates the at least one reservation map for reserving time slots and wavelengths for transmitting data to and receiving data from a plurality of nodes, made up of the source nodes and destination nodes, based upon available time slots and wavelengths in the network; and

a demand matrix generating unit for generating a demand matrix based upon the demand data from the plurality of nodes in the network;

wherein said reservation map is based upon said demand matrix.

19. A media access controller as recited in claim 18, wherein said reservation map is created based upon demand matrix data transmitted from another of said plurality of nodes.

20. A media access controller as recited in claim 18, wherein said demand matrix

unit and said reservation map unit are configured for operation with an optical ring network.

21. A media access controller as recited in claim 18, wherein said demand matrix unit and said reservation map unit are configured for operation with optical elements of the optical network connected in a star-coupler topology.

22. A media access controller as recited in claim 18, wherein said demand matrix unit and said reservation map unit are configured for operation with a local area network.

23. A media access controller as recited in claim 18, wherein said reservation map unit is configured to set the reservation map using reservation map data transmitted from another of the plurality of nodes.

24. A method for communicating optical data on an optical network, said method comprising:

receiving optical data from source nodes at a plurality of source wavelengths at a tunable wavelength receiver;

transmitting optical data to destination nodes at a plurality of destination wavelengths from a tunable wavelength transmitter; and

controlling the tunable wavelength receiver and the tunable wavelength transmitter, via a media access controller by scheduling transmission to and receipt from a plurality of nodes at a plurality of time-slots and wavelengths according to at least one reservation map.

25. A method as recited in claim 24, wherein said controlling step further comprises creating the at least one reservation map for reserving time slots and wavelengths for transmitting data to and receiving data from a plurality of nodes, made up of the source nodes and destination nodes, based upon available time slots and wavelengths in the optical network, said reservation map being based upon demand data from the plurality of nodes.

26. A method as recited in claim 25, wherein said controlling step further comprises generating a demand matrix based upon demand data from the plurality of nodes, and wherein said reservation map is based upon said demand matrix.

27. A method as recited in claim 26 wherein said step of creating the at least one reservation map is performed based upon demand matrix data transmitted from another of said plurality of nodes.

28. A method as recited in claim 26, wherein said step of controlling the tunable wavelength receiver and the tunable wavelength transmitter are performed within an optical ring network.

29. A method as recited in claim 26, wherein said step of controlling the tunable wavelength receiver and the tunable wavelength transmitter are performed within optical elements of the optical network connected in a star-coupler topology.

30. A method as recited in claim 26, wherein said step of controlling the tunable

wavelength receiver and the tunable wavelength transmitter are performed within a local area network.

31. A method as recited in claim 25, wherein said step of creating the at least one reservation map is configured to set the reservation map using reservation map data transmitted from another of the plurality of nodes.

32. A method as recited in claim 24, wherein said step of receiving optical data is performed to be optimized with other tunable wavelength receivers of other communications nodes of the optical network, such that the tunable wavelength receiver and the other tunable wavelength receivers are tuned to a common wavelength to receive multicast or broadcast transmissions.

33. A method as recited in claim 24, wherein said controlling step further comprises reordering said reservation map when said reservation map is blocked such that the available time slots cannot be allocated without causing a collision.

34. A method as recited in claim 24, further comprising the steps of negotiating an outgoing bandwidth allocation to the destination nodes through an allocator unit and negotiating incoming bandwidth allocations from the source nodes through a requestor unit.

35. A method as recited in claim 34, wherein said step of negotiating an outgoing bandwidth allocation further comprises sending a request to allocate or release

bandwidth from the allocator unit in the plurality of nodes, according to bandwidth demand data.

36. A method as recited in claim 35, wherein said step of negotiating an outgoing bandwidth allocation further comprises receiving a request to allocate or release bandwidth from the requestor unit in the plurality of nodes, and allocating or releasing time-slots and wavelengths according to at least one of the request, a request priority and system allocation rules.

37. A method as recited in claim 36, wherein said step of allocating or releasing time-slots is performed according to local bandwidth demand.

38. A method as recited in claim 36, wherein said step of negotiating an outgoing bandwidth allocation further comprises sending acknowledgement for allocating or releasing time-slots to the requestor unit.

39. A method as recited in claim 24, wherein the step of receiving optical data is performed being fixed on one wavelength while the step of transmitting optical data is performed by tuning for each time-slots according to the at least one reservation map.

40. A method as recited in claim 24, wherein the step of transmitting optical data is performed being fixed on one wavelength while the step of receiving optical data is performed by tuning for each time-slots according to the at least one reservation map.